



(19)

Generated Document.

(11) Publication number: **04323834 A****PATENT ABSTRACTS OF JAPAN**

(21) Application number: 03092119

(51) Int. Cl.: H01L 21/336 H01L 29/784 H01L 21/205
H01L 21/84

(22) Application date: 23.04.91

(30) Priority:

(43) Date of application
publication: 13.11.92(84) Designated contracting
states:

(71) Applicant: SEIKO EPSON CORP

(72) Inventor: OKA HIDEAKI

(74) Representative:

**(54) SEMICONDUCTOR
DEVICE AND
MANUFACTURE THEREOF**

(57) Abstract:

PURPOSE: To reduce the OFF current of an insulated gate type field effect transistor by a method wherein a fluorine content in a polycrystalline semiconductor layer is controlled to be not higher than 1×10¹⁸/cm³.

CONSTITUTION: A polycrystalline semiconductor layer 109 mainly

made of silicon is formed on an insulating layer 107 which is to be a gate insulating film. The polycrystalline semiconductor layer 109 is formed by a plasma CVD method with mixed gas composed of monosilane, disilane, trisilane or the like and hydrogen gas with a ratio of 1:20-1:200 as reactive gas. Then fluorine ions are implanted as impurities to form source/drain regions 110. The source/drain regions 110 formed by ion implantation are activated by annealing. A fluorine content in the polycrystalline semiconductor layer 109 is so controlled as to be not higher than $1 \times 10^{18}/\text{cm}^3$. It is to be noted that the annealing treatment for the activation is performed in a plurality of times with different temperatures respectively. With this constitution, the OFF current of an insulated gate type field effect transistor can be reduced.

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